

AMERICAN VETERINARY REVIEW,

JULY, 1892.

EDITORIAL.

ACTINOMYCOSIS.—The subject of actinomycosis has of late received a great deal of attention from American veterinarians, with the result of giving rise to the expression of very contradictory opinions which were freely exhibited pending the trial held last year in Peoria, Ills. We have impartially reported all the various theories and arguments propounded during the pendency of that memorable event, and have, we think, done justice to all the parties professionally interested in the matter without reference to the shades of opinion, or theory, or school they may have espoused, or whether in the eye of the law they may have appeared on the right or the wrong side of the case. In the publication of one of the various critiques on the subject we were obliged to express our opinions in relation to some different considerations connected with the case on our part, and explained that we were giving the subject a great deal of thought, and that we were not yet well prepared to change the opinion we had expressed at the trial.

In continuing our investigations our attention has been directed to the publication of some notes on actinomycosis presented to the *Societe Centrale de Medecine Veterinaire*, by Professor Nocard; and as his opinion on all matters pertaining to our science is accepted as of the highest authority, we have much pleasure in making certain citations from his expression of views, which may prove interesting and important in connection with the subjects involved in the Peoria trial. After a few allusions to the presence of actinomycosis

in various parts of the world, and a quotation from the statistics of the disease, which shows a percentage of a comparatively small number in France, 95 cases only having been discovered out of 131,398 animals, or a proportion of 0.72 per thousand, the professor makes a few remarks upon the frequency of the seat of the actinomycotic lesions, and the location of the disease in certain organs, as the tongue, the bones of the head and the lungs, and enters upon the most interesting part of his communication, viz., the treatment of the lingual form of the affection, which, adopted by Professor Thomassen, of Utrecht, and recommended by him as early as 1885, had proved most satisfactory to him and the few who had practised it. The treatment of "actinomycotic glossitis," which is known by its symptoms and the peculiar condition of the organ affected, consists simply in the administration of iodide of potassæ, with which the local application of tincture of iodine may be combined. The history of several observations on this subject have heretofore appeared in the REVIEW.

The communication of Professor Nocard concludes with the etiology and mode of entrance of the parasite, which, for many reasons, ought to be considered as being introduced through the herbaceous food, the grains, the hay and the straw, which, when taken into the mouth, and finding a solution of continuity of the mucous membrane have thus met all the required facilities for infection. The lesions of the lungs may be explained by the inhalation and introduction of infected dust into the air passages, and the same may be said when the udder is the part affected, and the introduction of the parasite may have occurred through the milk channel. The invasion through the serous membranes and the abdominal organs may also be explained as occurring through the buccal cavity. For the renal form of the lesion he proposes no explanation.

The interesting points, as far as the Peoria case is concerned, follow, and we give them in a translation of Professor Nocard's own words:

The considerations above presented are, however, sufficient to show the predominating action of vegetable alimentation in the development of actinomycosis. But thus produced, is the disease contagious? Can it be communicated

by an affected animal to his neighbors? Does he constitute a danger for those who have the care of him? Can a man contract actinomycosis from diseased animals, as he does in cases of glanders, or rabies, as he receives it in aphthous fever, trichinosis, or even tuberculosis? Evidently, the question is not yet solved; but it can be said that if actinomycosis is contagious, it is so only in a degree so slight that the danger of contagion may be considered as a *negligible* factor. It is in the country where the disease is the rarest that such a question can be most usefully studied. In France, for instance, each veterinarian sees now and then a few cases of actinomycosis of the jaw. These cases remain always isolated, though the animals live and associate with others for years.

*Actinomycosis of the jaw has no effect upon the general habit of the subject; as long as the slow progress of the disease has not involved the dental alveola, or loosened the teeth from their sockets, and the animals live, eat, work, fatten and give milk as much and as well as their neighbors. But whatever may be the duration of the sojourn in the same barns, no matter how intimate the contacts with all animals may have been, never has the disease been seen affecting other animals; and yet from time to time the actinomycotic tumor has been seen to soften and ulcerate, and through existing and persistent fistulous tracts permit the escape of pus loaded with parasites. Yet, still, I repeat no case of direct contagion has yet become known.**

Besides it is known with what difficulty experimental actinomycosis can be obtained; whatever may have been the mode of inoculation, or the quantity of inoculating matter employed, or whether obtained from pure cultures or from fresh lesions, the result is always negative. Some authors have succeeded in giving rise to the development of tumors in animals which had received into the peritoneum fragments more or less voluminous of actinomycetes; but the inoculation by series has always failed, and, as the result, one is brought to the conclusion that to reproduce itself *de novo* in an animal organism the germ must perhaps pass through a different media. We know nothing of the evolutive period of the disease, but it is an allowable supposition that the vegetates, through which the introduction into the organism occurs, not only act as a vehicle of introduction, but that they probably furnish a necessary or perhaps simply useful substitute for an unknown phase of its evolution.

Should this hypothesis be admitted, the comparative history of this affection will be better understood; it is easily explained how, out of seventy-five observations of human actinomycosis counted by Moosbrugger, he could discover but a single patient who had been in contact with animals affected with tumors of the jaw, while in forty-nine cases they were found in persons whose vocations did not require their proximity to affected cattle.

The conclusion which imposes itself is that the source of infection is the same for both men and animals, and that in all appearances gramineous substances have served as vehicles for the introduction of the parasite.

In many of the cases of human actinomycosis where the cause has been traced it was in persons having thoughtlessly chewed or swallowed particles of straws or ears, or grains of wheat or rye. In the elucidation of the saprophytic

* The italics are ours.—ED.

life of the germ lies the only means of establishing on a solid basis the rules of an efficacious prophylaxy of actinomycosis, whether in man or in animals.

MALLEINE IN THE DIAGNOSIS OF LATENT GLANDERS.—How often have veterinarians been embarrassed in the presence of an animal possessing a symptomatic resemblance to glanders, and yet with such a want of positiveness in its manifestations that the question "whether it is truly glanders" had almost to remain unsolved.

And yet how many means are at his disposal of which he may avail himself, as aids in the solution of the question, among which are the various inoculations of other animals, from the small guinea-pig to the dog, the horse or the donkey. But to make such a system of inoculation available, something to inoculate becomes necessary, such as the various discharges, pus, glandular tissue, etc.; and how often are they absent? There are cases where the disease is localized in the lungs, and there is nothing externally visible, and in these cases what is to be done?

By the discovery of tuberculin, one fact was established, which, if applicable to the virus of other contagious diseases, would prove of great value.

This principle was that the products of secretion of the tuberculous bacilli, when cultivated *in vitro*, have a specific and altogether special *elective* action, upon the organic lesions caused by this bacillus.

If this action existed, was it peculiar to the tuberculous bacilli, or did it not exist as well for the pathogenous microbes of other diseases? It is an importont question, and it seemed to be answered in respect to glanders in the affirmative.

Two Hessian veterinarians, Kolning and Hellmann, were the first to announce the result of their labors in the obtaining from the extracts of cultures of glanders the malleine, which they claimed was capable of an action upon the lesions of glanders similar to that of tuberculin upon the lesions of tuberculosis.

Malleine is the glycerinated extract of the cultures of the bacillus of glanders, and according to the veterinarians referred to, a subcutaneous injection was followed in several

glanderous animals, by strong febrile reaction, while healthy horses used as *witnesses* or tests, showed no elevation of temperature. As we have before reported, Dr. Kolinn died from the inoculation of glanders, while engaged in his experiments.

These experiments have been quite extensively repeated since. Professor Nocard recently read before the *Société Centrale*, a communication relating to his experience with the new agent, which ends with a statement of the results obtained by him, as follows:

1. The subcutaneous injection of malleine in the dose of a cubic centimeter, gives rise, in *glanderous horses*, to a strong ebile reaction, appearing as early as the eighth hour after the operation, and lasting for several hours following.

2. If the elevation of temperature exceeds two degrees, it can be affirmed that *the animal has glanders*—if the temperature does not vary, or rises less than one degree, *the animal has no glanders*. If the temperature rises between one and two degrees, it is not yet possible, in the present condition of our knowledge, to be positive as to whether the animal has or has not glanders; he must be considered as doubtful, and treated accordingly.

3. In all infected stables, it would be advantageous to submit all the contaminated animals to the malleine test. A better surveillance, a better regulated abatage, and more judicious sequestration would follow, and in any case no new victims of the disease would be found.

The period must certainly soon arrive when all practitioners, and especially all State veterinarians, will consider malleine one of the most important factors in their diagnosis, prognosis and sanitary remedies, in cases of latent and of doubtful glanders.

NEW YORK STATE VETERINARY MEDICAL SOCIETY.—We have received, as we go to press, the notice of the semi-annual meeting of this Society, sent to us by the kindness of the Secretary, Dr. N. P. Hinkley, V.S. The doctor sends us, besides the notice, an urgent appeal addressed to veterinarians in the State, asking them to lay aside all personal and

professional business for one day to attend the meeting on the 14th of July. It is to be hoped that the call will not be ignored, and that the roll call will show every section of the State represented at the meeting in Syracuse. New York State ought not to remain without a veterinary society doing work in behalf of the profession, and the present Society promises well if it only receives the support of the veterinarians of the State. The notice reads as follows:

NOTICE.—The semi-annual meeting of the New York State Veterinary Medical Society will be held at the Vanderbilt House, Syracuse, on Thursday, July 14th, 1892, 10 o'clock A.M. Every qualified veterinarian in New York State ought to attend the meetings of this Society and offer his assistance in accomplishing the good work it has undertaken for the benefit of the profession throughout the whole State. We extend a cordial invitation to every one of you to join us in this attempt to elevate the standard of our profession. Several papers of interest will be read and offered for discussion.

N. P. HINKLEY, D.V.S., Sec'y.

ORIGINAL ARTICLES.

ACTINOMYCOTIC GLOSSITIS.

TREATMENT BY THE ADMINISTRATION OF POTASS. IODIDUM.

BY MR. GODBILLE.*

First observation. September, 23d I was called to visit a four-year-old cow, and at once recognized her trouble. The tongue was one third larger than normal, hard, and with its superior and lateral faces covered with yellowish nodules. She salivated profusely; the intermaxillary space was much swollen and oedematous, and prehension of food was difficult, as well as mastication; temperature normal. According to the owner, the disease had existed for the past ten days.

The animal was left in the pasture, and the daily administration of 12 grammes (about two drachms and a half) iodide potassa in two doses, in about a pint of water, was prescribed.

Ten days later the symptoms were much improved; sali-

*Extracts from Professor Nocard's paper before the *Soc. Cent. de Med. Vet.*

vation much reduced, swelling of the maxillary space almost disappeared ; the tongue had again assumed its normal size and mobility ; the yellowish nodules had disappeared, and in their place were reddish granular spots, true cicatrices, not yet covered with epithelium. The patient ate well, her flanks were full and lactation normal.

A peculiar feature was that the entire skin became covered with large, thin epidermic pellicles, of an orange yellow color, principally on each side of the neck. The eyes became swollen, the lacrymation quite active, and there were coryza and diarrhoea. As soon as these evidences of iodism were manifested, the organism being saturated with potass. iodide, and the animal on the way to recovery, the treatment was stopped. The recovery was radical, a week after.

Second observation. October 8, 1891, a cow nine years old showed an actinomycotic tongue, of eight days' standing. She was kept in the barn, and received every day in two doses, ten grammes of potass. iodid. Diet : grass and mashes of bran and rye flour.

Ten days later improvement was well marked ; but signs of iodism were less pronounced than in the first case, as the eyes were less swollen and lachrymation less. But the epidermic exfoliation was very marked.

Considering the animal cured, she was returned to the pasture, and all treatment suspended, but four days later the prehension of food again became difficult and maxillary space became puffy and she was brought back to the barn and received six grammes of the iodide morning and evening ; the iodism then reappeared and more severely than at first, and then everything proceeded favorably. Her recovery was final.

Third observation. A steer four years old had for a few days back refused his food and had salivated abundantly. On examination of the mouth, the tongue seemed absolutely normal, but the palate was tumefied and covered with yellowish nodules like those of an actinomycotic tongue. In the same field six weeks before, a steer had been kept, which was destroyed on account of actinomycosis of the tongue.

This patient received potass. iodid. in decreasing doses, fifteen grammes the first day, thirteen the second, then eleven, nine, seven and five grammes, a dose which he received until the twelfth day, when he appeared entirely recovered, although the phenomena of iodism were not well marked.

Fourth observation. A heifer of eighteen months was affected. She was placed under the same treatment, with gradually increasing doses, beginning with five grammes the first day, and increasing one daily until twelve. The symptoms of iodism became well marked on the sixth day, with on the eighth, coryza, an abundant flow of tears, and epidermic desquamation. The treatment was then discontinued. A few days later recovery was complete.

The following case is recorded by Prof. Nocard himself. A cow six years old, losing flesh rapidly, was sent to the butcher for slaughter. She was in bad condition, hollowed at the flank, and with the maxillary space filled with a hard, painless mass of the size of a man's arm, not adherent to the skin. A thick viscous saliva escaped from the commissure of the lips, and exploration of the mouth seemed painful. The tongue was very large, principally at the base, hard and nodulated, and but slightly flexible; the lateral faces covered with small tuberculiform nodosities, the mucous membrane ulcerated in spots, pressure upon which forced out little yellowish masses, which when crushed showed under the microscope the tufts of actinomycotic growth. The temperature was normal; pulse, 46°; respiration, 12. After a few days the animal was placed under treatment as follows:

March 15th she received six grammes of potass. iodidum in a pint of water in one dose, and this was followed by eight grammes in two doses, one in the morning and one in the evening before meals. Three days later there seemed to be some improvement; on the 19th signs of iodism were well marked, and the symptoms had subsided in severity. On the 21st, everything was better accentuated, the improvement being more manifest, as the iodism was better marked.

On the 24th everything had assumed its normal aspect and the treatment was discontinued, and since then the animal has regained her general fat condition.

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TUBERCULOSIS OF ANIMALS IN ITS RELATION TO HUMAN ALIMENTARY HYGIENE.

BY PROF. S. ARLOING.

(Continued from page 138).

II.

We believe we have answered all the principal objections which have been urged against the conclusions adopted by the various congresses in which the question of tuberculosis has been discussed. A few words more, however, may be of use.

It would have been surprising if from one congress to another there had been no progress accomplished in the ideas elicited and illustrated by means of these discussions. In 1888 it had been decided "*that it was necessary to enforce by all means possible, including the indemnification of interested parties, the general application of the seizure, and total destruction of all the meats of tuberculous animals, whatever might be the severity of the lesions found in those animals.*"

The ministerial decree issued during the time when your discussion was in progress did not include features of total seizure, or of indemnification. It remained satisfied with the exclusion of the meat from tuberculous animals. *First, if the lesions were generalized, viz., not exclusively confined to visceral organs and their lymphatic glands; and secondly, if the lesions, though localized, had involved the greater part of a viscera, or were manifested by an eruption upon the walls of the thoracic or the abdominal cavity.*

These restrictions had afforded evidence of important progress in the service of meat inspection, the superior authority having thus indicated to the municipal magistrates the duty they had to fulfil, and to the veterinary inspectors the limits within which they might interfere. Some of our colleagues consider that these restrictions are sufficient to amply satisfy all needed requirements, and remove all the dangers against which they are directed. But we respectfully beg leave to dissent from the optimistic views of our friends.

We are not satisfied with the decree of 1888, either in regard to the scientific or to the practical aspects which are presented to our view.

Indeed, in allowing free circulation to tuberculous animals, for the reason that the alterations have not gone beyond the affected organ, it implies that the virulent bacilli in these animals are never found in the vascular network of the muscles and glands, which in numerous cases would be an extravagant and erroneous assumption.*

And again, in allowing inspectors such a latitude of judgment in respect to the importance and the extent of tuberculous lesions, there remains an open door for very dangerous differences of appreciation and irregularities and errors of conduct. We have seen this exemplified in Lyons, when the veterinary inspector endeavored to conform to the provisions of the official regulations. Dairies are numerous in that region, and cattle dealers protested against the severity exercised in that city, making unfavorable comparisons between that and the lenity and consideration practised in other places.

To be simpler and more logical, we would then propose to the congress to persevere in the principle of the entire seizure and destruction in all cases, without distinction, of the condemned cattle. But we must not forget that the opposition to any measures designed to suppress the consumption of tuberculous meats is with an important class of interested persons largely and exclusively a question of money, and we have also shown that these measures affect one class of agriculturists more intimately than agriculture itself, pure and simple. If we could so alter things that this fact could be ignored, then all minds might be brought into a general harmonious co-operation in the matter. In other words, instead of leaving those who are entirely dispossessed by the seizure of the diseased products to sustain the entire loss, the result-

* In a Hygienic Congress held in London not long since, Messrs. McFadyean and Woodhead reported a case in which the intra-muscular and tuberculous deposits existed with some nodules in the lungs only, and a few lymphatic glands.

ing damages ought to be equitably divided and apportioned among all who are in any degree benefitted by their interest in the trade of the cattle-market. In order to accomplish this, we propose the institution of a system of mutual warranty and assurance, which, when properly organized and operated, could not fail to be followed by excellent results. The objection to such a proposition was that it would involve the investment of a large capital.

To resume, I have the honor of asking this congress to persist in its previous declarations, excepting perhaps the clause relating to the destruction of the confiscated meats. And, moreover, in the interest of the public health, I would urge the establishment of an authorized meat inspection for the entire territory, and with the least possible delay. And *secondly*, I would ordain that the meat of tuberculous animals in its fresh state should in every case, without distinction, be strictly excluded from the markets, or from entering into general consumption as human food. *Thirdly*, it should be sterilized, or transformed by the application of sufficient heat, or by salting, according to location and other circumstances, before being offered for consumption. *Fourthly*, the cost involved in these transformations or modifications should be compensated by an indemnity. And *fifthly*, and finally, this indemnity should be paid from a special fund derived from a tax assessed upon every head of cattle inspected.

ENORMOUS DIMENSIONS OF THE STOMACH OF A HORSE
—In making the post-mortem of a horse fourteen years old, veterinarian Koch, inspector of markets at Hagen, found the stomach of his subject to answer to the following dimensions: Filled with no less than $51\frac{1}{2}$ kilograms of food, with the shape of an enormous egg, longitudinal circumference measuring 1 meter and 90 centimeters, while transversely its circumference was 1 meter and 46 centimeters, at the same time it contained 84 litres of water. The mucous membrane of the left sac occupied a space four times larger than that of the right.

LICE AFFECTING DOMESTIC ANIMALS.*

BY HERBERT OSBORN.

The following pages on some parasites that affect our domestic animals are extracted with but slight alteration from the writer's paper† published by the Division of Entomology U. S. Dept. of Agriculture, and we desire here to acknowledge the kindness of the Department officers in allowing the use of the cuts which accompany it.

It is needless to speak of the importance of the subject or to present any apology for devoting space to its consideration. The keeping of live stock for work, dairy, and meat or wool production is one of the most important industries in the state and the injuries of parasitic insects often assume important proportions. While only a few species are treated in the present paper they are such as require frequent attention.

The common lice of our domestic animals belong to two quite distinct groups of insects, and may be called for convenience the suctorial lice (which form the family *Pediculidae*) and the biting or running lice, which do not penetrate the skin to suck blood, but feed upon the epidermal scales, hairs, feathers, etc. (which are included in the family *Mallophagidae*).

THE SUCTORIAL LICE.

In these there is a tubular mouth capable of being thrust into the skin to draw blood. The feet are adapted to clasping hairs and the insects are poorly adapted for locomotion except in the hairy covering of animals.

The eggs, "nits," are attached to hairs by a glue-like substance, and the young lice when hatched resemble the adults except in size. As the entire life of the parasite is passed upon the same animal or another animal of the same kind, its range of habit is easily stated.

*From Bulletin of Experimental Station of Iowa.

†I. The Pediculi and Mallophaga affecting Man and the Lower Animals, by Prof. Herbert Osborn. Bulletin 7, Division of Entomology, U. S. Department of Agriculture, 1891.

But very few of the species are ever found upon any other species of animal than that which they normally infest, and if so always upon very nearly related species. Whether this is due to differences in the skin, of temperature, of the size of the hair to which they must adhere and to which their feet are adapted, or to some subtle difference in the odor or taste peculiar to their particular host which leads them to discard all others, we are unable to say.

The mouth parts are necessarily capable of great extension in order to reach the blood of their hosts. Uhler says (Standard Nat. Hist., II, p. 209): "A fleshy unjointed rostrum, capable of great extension by being rolled inside out, this action serving to bring forward a chaplet of barbs which imbed themselves in the skin to give a firm hold for the penetrating bristles, arranged as chitinous strips in a long, slender, flexible tube, terminated by four very minute lobes which probe to the capillary vessels of a sweat pore (see Fig. 1). The blood being once reached a current is maintained by the pulsations of the pumping ventricle and the peristaltic movements of the stomach."

THE SUCKING DOG-LOUSE. (Plate I, Fig. 2.)

Hæmatopinus piliferus, Burmeister.

Although the dog has been the closest companion of man among the domestic animals from very early times, and consequently this parasite in all probability was well known to



FIG. 1.—Mouth parts of *Pebiculus vestimenti*, showing rostrum and extensile tube—greatly enlarged.

keepers of dogs, it was not technically described until about the year 1838.

It does not appear to have been a very numerous or injurious parasite, apparently much less so than the *Trichodectes latus* infesting the same animal, and less annoying than either ticks or fleas. Denny says (Monog. Anop. Brit., p. 29), "I have found it upon dogs two or three times, but it is by no means of common occurrence." We have examined many dogs in quest of it, but only a single specimen has so far been our reward. Denny says (loc. cit.), "I also received specimens from the ferret." It can hardly be inferred, however, that this animal is a normal host for the species, as such an instance might occur entirely from accident, the louse having been transferred from some dog to a ferret associated with it.

This species is somewhat smaller than the lice infesting most of the larger mammals, the full-grown individuals being nearly one-tenth of an inch long. It is described generally as of a light-red or ashy flesh color, but evidently varies as the other species, according to condition of the body as well as age of specimens. In preserved specimens these colors become lighter, assuming a yellowish hue, the abdomen, except where darkened by the intestine and its contents, appearing a shade lighter than the front part of the body. The abdomen is thickly covered with fine hairs and minute warty eminences, these latter when magnified about 300 diameters appearing like the scales of a lizard or fish.

Specimens from different breeds of dogs do not appear to have been noticed as different, though a form described as *H. bicolor* by Lucas may perhaps be found to present race characteristics.

THE SHORT-NOSED OX-LOUSE. (Plate I, Fig. 1.)

Hæmatopinus eurysternus, Nitzsch.

This is the species that has probably been familiar from early time as the louse infesting cattle, though since this species and the following one have been generally confused, it is impossible to say which has been most common. It was first accurately described by Nitzsch under the name of

Pediculus eurysternus, in 1818 (Germar's Mag., vol. III, p. 305), and has received mention in every important treatise on parasites since that date, as well as innumerable notices under the head of animal parasites, cattle lice, etc. As with other species, the disease produced has been termed phthiriasis, and as treated by Kollar and other writers it has been recognized as a most serious pest and numerous remedies tried for its suppression.

Since it has been very generally confused with the following species we shall give more particular description and show as clearly as possible how to distinguish them. The following quotation from Mr. C. W. Tenney (in *Iowa Homestead* for August 18, 1882) will show that this difference is not without interest or value as viewed by a practical breeder: "Then there is a blue slate-colored louse and a larger one of the same color that vary somewhat in their habits, and the last mentioned is the hardest to dislodge." Evidently it is the species under discussion to which Mr. Tenney refers as the "larger one." It infests particularly the neck and shoulders, and these parts are frequently worn bare by the efforts of the animal to rid itself of the irritation produced by these unwelcome visitors. Still, some cattlemen say that these parasites are of no consequence, and that they never pay any attention to them.

The full-grown females are about one-eighth to one-fifth of an inch long, and fully half that in width, while the males are a little smaller and proportionately a little narrower. Aside from the difference in size the sexes differ very decidedly in the markings and structural features on the under side of the body. The males have a broad black stripe running forward from the end of the body to near the middle of the abdomen, as shown in Fig. 1 *c* (Plate I).

The females have no indication of this stripe, but the black broken band of the upper side of the terminal segment extends slightly around on the under side. The most important character, however, is the presence of two little brush-like organs on the next to the last segment, as shown in Fig. 1 *d* (Plate I).

The head is bluntly rounded in front, nearly as broad as

long and with the antennæ situated at the sides midway from the posterior to the anterior borders; behind these are located slight eminences upon which may be found the small eyes, which are seen with considerable difficulty. At the front of the head may be seen the small rostrum or beak, the end of which is usually at or near the surface, but which is capable of extension and retraction. The end of this beak is armed with a double row of recurved hooks (see Fig. 1 b). The function of these hooks is doubtless to fasten the beak firmly into the skin of the host, while the true pumping organ must consist, as in the *Pediculi* of a slender piercing tube, though we can see only slight indications of this tube within the head, and we have not seen it nor do we find any record of its having been seen fully extended in this species. Professor Harker says the rostrum can be pushed out, but his figure shows only the basal portion with the crown of hooks and nothing of the tubular parts inclosed within.

The thorax is wider than long and widest at the posterior margin where it joins the abdomen. The legs project from the side, are long and stout, and especially adapted to clasping and clinging to the hair. An extra provision for this purpose consists of a double plate having fine transverse ridges in the basal joint of the tarsus. This structure appears to have been first described by Professor Harker (*Agricultural Students' Gazette*, vol. I, p. 162). The abdomen differs greatly in form and size, according to the degree of distention, which accounts for the discrepancies in the different figures of this species. It may be called flask-shaped and more or less flattened according to the amount of matter contained in it. There is a row of horny tubercles along each side and a row of chitinous plates along each side of the upper surface of the abdomen. The spiracles are located in the tubercles at the sides, and there is one to each of the last six segments omitting the terminal one. In color there is some variation, as would be surmised from a comparison of descriptions by different authors. The general color of the head and thorax is a light brown approaching to yellowish, with touches of bright chestnut on the head and legs and margins of the

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thorax, also touches of dark brown on these parts, more particularly on the dorsal portion of the thorax. The abdomen in fresh specimens has a general bluish aspect, not so noticeable in preserved specimens, besides its color depends evidently in large degree upon its contents. Denny says "grayish-white or ochraceous gray," which would apply well to preserved specimens, but this plate shows it a blue-gray. Harker says brownish gray. It appears to us that the term used by Mr. Tenney, blue slate-colored, comes quite as near describing the average appearance as any that we have seen. The tubercles at the side of the abdomen and the chitinous plates are chestnut-colored, while the most of the upper surface of the terminal segment in the female and the ventral stripe in the male are black.

The females deposit their eggs on the hair, attaching them very near the skin. Fig. 1 *e* represents one of the eggs, showing its attachment to the hair and the distance from the root of the hair in the specimen drawn. The adhesive substance evidently invests the egg during oviposition and is attached to the hair, the egg then slightly drawn along so as to leave the glue-like mass to form a firm union around the hair and to the egg. The egg is elongate-shaped, tapering at the lower end, and having a cap-like covering at the upper end. The surface is set with very minute points just visible under an inch objective, but showing clearly with a power of 300 diameters. At the surface no connection is to be seen between different points, but focusing a little below the surface brings into view what appear to be minute threads or channels running from point to point and giving a reticulate appearance to the eggshell. The points cannot correspond to the circular bodies represented in Denny's figure (E, Plate xxv, Monog. Anop. Brit.) which have much more the appearance of protoplasmic granules of the egg contents. The shape of the egg in his figure is also entirely different from that of the specimen from which our figure is drawn.

The young louse escapes from the outer or unattached end, whether by pushing off the cap-like portion or simply pushing through this portion which appears to be thinner

than the rest and may be simply membranous, is not, so far as we know, determined. No marked changes, except in size and the development of the chitinous patches, occur from hatching to maturity.

This is one of the most difficult parasites to destroy, and once settled upon an animal should receive prompt and thorough treatment. The main reliance of veterinarians seems to be stavesacre, and this can doubtless be depended upon to accomplish the desired end. Mr. Tenney recommends the seed of common larkspur steeped, and the animal thoroughly washed with the liquid. He says: "I have known one application to destroy every insect and egg; two will suffice if done thoroughly." Of course this and the stavesacre are nearly identical, both plants belonging to the genus *Delphinium*. Washes of carbolic acid soap or of tobacco infusion are also effectual, but washes of any kind are of course illly adapted to use in midwinter, the time when there is frequently most necessity for treatment. Mercurial ointment, sulphur, or tobacco smoke, kerosene and lard, or kerosene emulsion, road dust, ashes, etc., may be resorted to, according to the circumstances. Infested animals should, if possible, be placed apart from the others, and much trouble may be saved by this precaution.

Experiments with fumigation have shown this to be a method available when other plans are undesirable, though from the equipment necessary, and the fact that it requires some time in application, it may not prove of as general service as the washes, especially the kerosene emulsion.

The method may be said in brief to consist of a tight box-stall just large enough to admit the largest animal to be treated, one end having a close-fitting door to admit the animal, the opposite end a stanchion in which the animal is fastened, and covering the open part of this end, and made to fit tightly around the head just in front of the horns, is a canvas sack open at both ends, the inner one nailed to the stall and the outer with a running cord to draw it down to the animal's head, thus leaving the eyes and nose in open air. An opening at the bottom of one side admits fumigating sub-

stance, sulphur or tobacco, the latter apparently the most effective. In burning this we used a wire screen to spread the tobacco, placing this over a tin trough containing a small quantity of alcohol. It could be burnt, however, with coals or using a small quantity of kerosene. The time of exposure necessary will vary some with the strength of fumes, but one to two ounces of tobacco and exposure of 20 to 30 minutes was found effective. Pyrethrum might be better even than tobacco.

This species has been said to occur also on horses, but if this is the case it must be in rare instances, and there need be little apprehension of horses becoming infected with it by transmission from cattle with which they may be associated.

THE LONG-NOSED OX-LOUSE. (Plate I, Fig. 3.)

Hæmatopinus vituli, Linn.—*tenuirostris*, Burmeister.

In connection with the preceding species this louse, as already stated, has long been familiar to cattlemen; it has also been known to entomologists for a considerable time, but its history from the entomological side is not entirely clear. It seems to have been first technically described by Linnæus under the name of *Pediculus vituli*, which name has been followed by Fabricius, Berkenhout, Stuart, and Turton, and, with the exception of the change in the generic name, by Stephens, Denny, and English and American authors generally. Nitzsch describes it under the name of *Pediculus oxyrhynchus*, which name was Latinized by Burmeister to *tenuirostris*. This designation has been followed by Giebel and Piaget, but why the earlier name of Linnæus was dropped we fail to discover. It seems more proper to retain the name given by Linnæus.

In this species the body is about one-eighth of an inch long and not more than one-third of that in width (see Flg. 3). The head is long and slender, the antennæ set near the middle each side; there is but a very slight protuberance behind the antennæ and no eyes visible. The head sets well back into the thorax, forming an acute angle behind; the thorax

is longer than wide, and has a distinctly showing spiracle above the second pair of legs; the abdomen is elongate, without chitinous plates and devoid of any tubercles along the sides; the terminal segment is also devoid of black horny band; the brush-like organ on the under side of the abdomen (see Fig. 3) is slender, while the terminal segment is set with numerous rather long hairs.

In all of these points it will be observed there is a distinct difference from *eurysternus*. The brush-like organ on under surface of the abdomen, common to females of related species and which is wanting in young of all species, must be taken as distinct evidence of the maturity of the specimens. If, however, there were any doubt on this point, a study of the young of *eurysternus* gives equally conclusive testimony. In the very youngest *eurysternus* we have seen that the chitinous tubercles along the sides of the abdomen inclosing the spiracles are distinctly to be seen, while the head, though longer proportionally than in adults, is by no means equal in length to that of adult *vituli*. A young *vituli* found, it is true, associated with *eurysternus* shows this elongation of the head still more markedly. In color there is little difference in the two forms, this species having rather duller colors upon the head and thorax. The abdomen of young specimens, when full of blood, appears dark red, but the bluish-gray hue is more prominent in adults. The eggs of this species have not been described, and we have not had the good fortune to discover them. The young are even more slender than the adults.

The remedies that are available for the preceding species will prove effectual for this, and it is evidently less difficult to subjugate than that form.

THE HOG-LOUSE. (Plate I, Fig. 5.)

Hæmatopinus urius, Nitzsch.

Occasionally this species appears in formidable numbers, since we often hear of swine badly affected with lice, and no other species is known to attack this animal.

Giebel credits this species to Mouset, citing the *Theatrum Insectorum*, (1634, 266), while Piaget states that it is cited by

Moufet on the authority of Albertus (IV., C. 205), which would carry its recognition back to the thirteenth century Linnaeus described it under the name of *Pediculus suis*, which name has been most commonly followed, but Nitzsch revived the name of *urius*, and this name has been followed by Giebel and Piaget. Along with other parasites it received frequent mention by both early and modern writers. Denny speaks of it as rare in England, but common in Ireland. He says (Monog. Anop. Brit., p. 35):

"This species is found in great numbers on swine, but it does not appear so generally spread as might be expected from the dirty habits of the animals. It most frequently occurs on those fresh imported from the sister isle. It was many months before I could obtain a single example. I had applied to both farmers and pig butchers, neither of whom seemed to approve of the idea which I had conceived, that of their pigs being *lousy*, but referred me to those of the Emerald Isle as being sure to gratify my wishes (forgetting, I suspect, that the Irish pigs come to this market to meet English buyers). I accordingly visited a colony just arrived, where I most certainly met with a ready supply; but here they were confined almost entirely to lean animals, and wherever I found a pig fat and healthy no game were to be seen."

Most stockbreeders have probably seen instances of its abundance, and from the frequent mention of it in the agricultural papers, it would seem to be quite common throughout the country, and while, perhaps, less generally distributed than the ox-louse, to multiply sometimes so as to cause much more apparent damage to its host. The fact that they are more commonly found on poor or runty animals should not be taken as evidence that they have a preference for such animals, but rather that the animals upon which they have multiplied rapidly have, in consequence, become emaciated and unhealthy. That they do not increase more rapidly and become a much greater nuisance, may be in part because the majority of hogs are sold and slaughtered at a comparatively early age, and with each one slaughtered must perish the parasites which have been supported by it, unless, perchance, an

occasional one escape the scalding trough and succeed in finding another host. Of the vast number of hogs shipped to market and slaughtered at the great packing houses, none can bequeath the insects they have nurtured to their followers. The amount of injury and the consequent need of precautionary measures are, therefore, much less for this species than for many others.

This is one of the largest species of the family, full grown individuals measuring a fourth of an inch or more in length. It is of a gray color, with the margins of the head and thorax and most of the abdomen dark; the head is quite long, the sides nearly parallel, with strong eminences just back of the antennæ, which are set on the sides of the head, midway from rostrum to occiput; the legs are lighter, with dark bands at the joints; the spiracles are inclosed by a black chitinous eminence, and there is a broad black band on the last segment, broken near the middle. (See Fig. 6.)

The male has the abdomen marked beneath with a large black area extending forward from the end of the terminal segment, so as to occupy the central portion of the last three segments.

There is a curious provision in the feet for strengthening the hold upon the hair, which does not seem to have been hitherto described.

It consists of a circular pad-like organ or disc in the outer portion of the tibia which is received in a conical cavity in the end of the tibia, and which can be forced out so as to press upon the hair held between the claws of the tarsus and the end of the tibia.

Ordinarily, and always in the dead specimens, this is withdrawn so as to appear simply as a part of the end of the tibia, and the spines located on its margin appear to belong to the tibial rim, but if examined with sufficient magnification when the louse is alive it is easy to observe the extrusion of the organ.

Whether similar organs exist in related species is yet undetermined, but it seems quite probable that they should, since in the specimens examined microscopically we have

usually to deal with dead and preserved individuals in which this structure would almost certainly escape notice.

The eggs are one millimeter and a half in length (.06 in.) by three-fourths of a millimeter in width (.03 in.). They are light yellow or dusky whitish in color, and taper slightly to the point of attachment. The circular lid-like portion is large, occupying nearly all the surface of the free end of the egg. They are attached usually near the base of the hairs.

On account of the thinness of the hair, the application of remedies, where necessary, is quite easy. Washes of tobacco water or dilute carbolic acid, and the application of kerosene in lard, or kerosene emulsion by means of force pump, sulphur ointment, etc., are recommended. The application of fine dust may be provided for naturally by allowing the hogs a chance to roll in the roadway or any place well supplied with fine dust. Where this is impracticable, the dust, ashes, or powdered charcoal may be applied directly to the neck and back of the infested animal. The species is not known to attack any other of the domestic animals, and hence no precautionary measures in this direction are necessary.

THE SUCKING HORSE LOUSE. (Plate I., Fig. 4.)

Hæmatopinus asini, Linn.—*macrocephalus*, Burm.

This species was figured by Redi (Exp., Pl. xxii., Fig. 1) and was described by Linnaeus under the name of *Pediculus asini*, presumably his specimens being taken from the ass. Later Burmeister described specimens from the horse under the name of *Pediculus macrocephalus*. Denny retains the name given by Linnaeus and states that it is common upon the ass, and that he also had specimens from the horse, from which circumstance he suspected Burmeister's *macrocephalus* to be the same. Giebel and Piaget both follow the name of Burmeister, and Piaget separates as a variety the form occurring on the ass, and gives it the name of *colorata*.

It seems hardly probable that it occurs in this country in sufficient numbers to cause much trouble on horses. Possibly examination of mules, asses, or donkeys would show greater abundance from the fact that horses in general are more care-

fully groomed than their somewhat despised relatives. The size is about the same as that of the ox-louse, but it differs very decidedly in the form of the head, which is long, slender, and the sides of the head nearly parallel, as shown in the figure (Fig. 9), taken from Comstock's "Introduction to Entomology."

Careful grooming may be looked upon as at least favorable to the reduction of numbers in this species. In case they become too numerous the application of a little kerosene to the card or curry comb used in grooming the animals will be found of value. When more vigorous treatment is necessary the measures recommended for the ox-louse may be adopted.

THE BITING AND RUNNING LICE.

Mallophaga.

This group embraces all the biting lice infesting birds and mammals. They are very distinct, indeed, from the preceding group, though frequently placed with them under such unnatural divisions as *Anoplura*, *Pediculines*, etc.

These bodies are usually hard and horny and much flattened. They possess mandibulate mouth parts adapted to cutting and biting the hairs, feathers, epidermal scales, or excretions on the bodies of their hosts. The jaws are situated on most forms underneath the head and near the center, the clypeus projecting and forming the most anterior portion of the head. The eyes when visible are located back of the antennæ. The antennæ are five-jointed except in *Trichodectes*. The thorax is generally narrow, and frequently but two divisions are apparent. The legs are adapted to clasping (*Philopteridæ*) or to running (*Liothediæ*), the tarsi in the first case being short and fitted for clasping against the tibiæ, and in the second case being long and provided with two claws well adapted to running. The members of the first division occur on both mammals and birds, those of the second, except *Gyropus*, are limited to birds. Wings are entirely wanting and the abdomen contains nine or ten segments and is usually oval in shape.

In life history this group agrees with the preceding. The

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eggs are glued to the hairs or feathers of the host animal and open with a circular cap or lid at the free end. The larvæ are less flattened, shorter in proportion, and without the hardened parts common to the adults covering a part of the surface. The length of life and rapidity of multiplication has not been determined for any species so far as we know, and the habits of the insects make any such determination a matter of great difficulty.

The effect of these upon the host animal may be less important than that of the suctorial lice, but judging from cases where serious results follow the efforts of the animals to rid themselves, and from the known irritation due to the crawling of anything among hairs and feathers, it cannot be doubted that they cause much inconvenience to the creatures which become their involuntary supporters.

BITING LICE OF HORSES, MULES, ASSES, ETC.

Trichodectes equi, of Authors.

The original reference by Linnæus to the lice of horses and asses under the name of *Pediculus equi* most certainly refers to the common *Trichodectes* infesting these animals, but Piaget has reached the conclusion that this reference is to the form subsequently described by Giebel as *Trichodectes pilosus*, and that the form described by Denny as *equi*, and which has since almost universally been treated as the Linnæan species, was in reality a different insect from that described by Linnæus under the same name. He therefore describes this form under the name of *parumpliosus*. It is certainly somewhat confusing to be obliged to drop the familiar designation for so common a species, and were it not that the conclusion has been reached by one who is probably the highest living authority regarding these insects we should hesitate to introduce the change. The figures given by Piaget, however, leave no doubt that there is a decided difference between *pilosus* and *parumpilosus*, and it is equally certain that our common species belongs to the latter form; so, if there is no question as to Linnæus having the form *pilosus* in hand, we certainly have no right on technical

grounds to apply the term *equi* to our common form. We will therefore introduce descriptions and comparisons of the two forms, and adopt, for the present at least, and on the authority of Piaget, the names given in his "Les Pediculines."

Trichodectes pilosus, Giebel. (Plate II., Fig. 7.)

This, according to Piaget, is the form originally designated by Linnæus as *equi*, and which, if that is correct, was the basis for a name which has been widely used to designate the biting lice of the members of the horse family. The original reference dates back considerably more than a century, and doubtless, the insect was familiar many centuries before that, as the horse and ass have been too familiar as domestic animals to allow the parasite common to them escaping entirely the notice of man.

According to Piaget this occurs upon both the ass and the horse, while the following species he has found only on the horse.

We have not been fortunate enough to secure samples of this form, though we have the other in great abundance, so we are compelled in describing to depend upon the excellent description and figures of Piaget, the latter being reproduced (in Fig. 7) for comparison. The head in this form is shorter and less rounded in front, that of the male being still less rounded than the female, while the abdomen is more slender and tapering. The transverse bands are also represented as less conspicuous. Perhaps the most striking point, however, is the position of the antennæ, which stand well forward on the head, so that the front border of the head and base of the antennæ are nearly in line.

The habits of the species and the remedies applicable to it are naturally identical with those of the other related species.

Trichodectes parumpilosus, Piaget. (Plate II., Fig. 6.)

While it does not seem possible that all the writers previous to Denny should have overlooked this form, which appears to be the more common one, at least on the horse, it

may be true that Denny was the first one to give it a thorough description and careful drawing. He speaks of it as common on the horse and ass, but Piaget says he has never found it on the ass, and there is, of course, a possibility that Denny did not distinguish between this and the preceding species.

In this species the head is decidedly rounded in front, the antennæ inserted well back, so that the head forms a full semi-circle in front of the base of the antennæ. The abdomen is more slender and tapering than in *scalaris*, but less so than in *pilosus*, as shown in Piaget's figures. The color is much the same as in the allied species, the head, thorax, and legs being a bright reddish brown or chestnut, and the abdomen of a dusky yellowish color, with about eight transverse dusky bands occupying the central or anterior portions of the segments and extending from the middle line a little more than half way to the margin. They are hardly as conspicuous as in *scalaris* and apparently rather longer and more conspicuous than in *pilosus*.

The habits of this species are well known and have received mention for many years. They seem to accumulate more particularly upon colts or horses in pasture, but their presence becomes most manifest in the latter part of winter, when they may become so numerous as to cause great irritation to the animals infested. They occupy more particularly the region of the neck, and also accumulate around the base of the tail and between the legs, and the animals will frequently rub bare places in these regions in their attempt to rid themselves from the irritation.

It is unnecessary to give any special notice regarding treatment, as they must be attacked on the same plan as other species.

Even if it proves that this species does not ordinarily infest the mule or donkey it would be policy not to allow these animals, if infested, to associate with horses, as we have no assurance as yet that they can not thrive on any of the members of the equine family.

(To be continued.)

TUBERCULOSIS.

BY DR. C. J. SIHLER, Kansas City, Kas.*

This is a specific infectious disease, produced by tubercles, which are in turn special products of a distinct micro-organism, known as the *Bacillus tuberculosis*. The actual or continued presence of tubercles is, however, not a necessary factor in the production, course or development of tuberculosis. Preexisting tubercles may have been discharged, or after softening become calcified or absorbed. In acute tuberculosis, it is not uncommon to find the spleen enlarged but free from tuberculous deposit.

The history of tuberculosis falls into five periods, three of which at least are quite distinct, in that they date from the discoveries of distinct individuals, Bayle and Lænnec, Villemin and Koch.

The first is the period of ancient history. During all this period the disease was observed from a clinical stand point only.

The second period, beginning with the birth of anatomy, in the sixteenth century, furnishes the first definite knowledge regarding changes of lesions of structure.

The third period, following the publications of Bayle and Lænnec, in the first quarter of the nineteenth century, declaring tuberculosis a separate affection, due to the deposit of tubercle, a specific product independent of ordinary inflammation.

The fourth period was introduced late in the last half of the nineteenth century, with the inoculation experiments of Villemin, in 1865; and the fifth was announced with the brilliant revelations of Koch, in 1882.

There is but one form of tuberculosis, and scrofula is only an external form of it. Villemin concludes tuberculosis is a specific disease. It belongs, therefore, among the virulent affections, and takes its places in nosology with small-pox, scarlet fever, syphilis, and more specially with glanders. The

* From the Report of the Kansas State Board of Agriculture.

disease arises, therefore, either by direct inoculation, by contagion, or, finally, by germs suspended in the air, or contained in the peculiar tuberculous matter. According to Professor Walley, hereditary tendency may be divided into direct and indirect : the former, when it is transmitted by a sire or dam to its immediate progeny ; the latter, when only transmitted to the second or third generation, constituting atavism. No predisposing cause with which we are acquainted exercises such a potent influence in the production of tubercle as this ; from sire to son, from dam to offspring, from generation to generation, often in unbroken succession, the fatal tendency is transmitted ; the more consanguinity is multiplied the more the tendency is increased, and the greater the virulence of the resulting products.

No animal whose system is tainted even in the slightest degree, or in whose history there exists the slightest suspicion of tubercle, should be used for breeding purposes.

A remarkable case, proving the transmissibility of the disease from the male parent to the progeny, is published by Zippelius: A stock-breeder purchased a bull, and with him served ten of his cows. The bull was found to be affected with tuberculosis, and for this reason was killed. All the calves of the ten cows which had been bred to this bull had eventually to be killed, because of this affection. The first symptoms of the disease in the calves were manifested when they had passed the adult age.

Williams says it is not only hereditary, but congenital ; and he has seen a calf three months old, which had thriven well until within two or three days of its death, filled with caseous, calcareous, and gray, tuberculous ulcers. In this calf the whole of the serous membranes were affected, which must have been formed in the uterus.

Adams relates an instance, from among many others, in which the lesions of the disease were observed in a calf which died a few hours after its birth, the mother at the time being affected with the disease. Semmes relates five cases of phthisis which he met with in the foetuses of cattle, and says these cases sufficiently prove that it can be developed during the embryonic stage.

This insidious and delusive disease is not the result of civilization, as many suppose. Barbarous and uncivilized races are afflicted as severely as many of the most advanced civilized races. Neither geographical position nor climatic condition is a factor in the distribution of tuberculosis; every known part of the globe, with a few isolated areas excluded, is a habitat of the disease. The only constant associated factor is found, in my opinion, in the inbred bovine species. If a community is closely associated with inbred dairy cattle, tuberculosis prevails.

P. L. Simmonds, in his book on "Animal Products," says: "The natives of South Africa delight in horned cattle of the bovine species; the natives are great milk drinkers. These barbarous people suck the blood from the jugular vein of the living bullock," and also "churn together blood and milk for a drink."

In Hirsch's book on the "Geographical Distribution of Phthisis," we find the following: "In Cape Colony phthisis is oftenest met with among the Hottentots inhabiting the plain near the coast."

In proof of the fact that these African cattle are inbred, we have the writings of Anderson, quoted by Darwin, as follows: "The Damaras take great delight in having whole droves of cattle of the same color, and take great pride in their oxen in proportion to the size of their horns. The Namaquas have a perfect mania for a uniform team, and almost all of the people of southern Africa value their cattle next to their women, and take great pride in possessing animals that look high bred."

These facts relating to the cattle-breeding propensities of the negroes account for the statement of Daniell, that "Phthisis is widely prevalent and very malignant among the negroes of the west coast of Africa. In the interior plateaus of southern Africa phthisis, however, hardly ever occurs. This immunity can be accounted for by the presence of the Tsetse fly. This fly inhabits well-defined regions in central Africa, and where it exists cattle, horses and dogs cannot live." Doctor Webster says, although the climate of St. Michael cannot be safely

recommended to a consumptive patient, it is, nevertheless, rare to see the disease in a native. Doctor Webster would not have been astonished at this condition of affairs, had he realized the truth, that phthisis is a disease acquired from the bovine race; for it is a fact that the only people on the face of the globe who enjoy absolute immunity from phthisis are those who are not in possession of the domestic cow. Take for instance the Kirghiz, on the steppes of Russia. These people consume large quantities of mare's milk, and eat the flesh of horses and sheep, but they have no cows. According to Doctor Neftel, a case of phthisis among these people was never known. The Esquimaux also enjoy immunity, because they have domesticated the reindeer—not the cow.

Let us look at a locality which once enjoyed immunity, but is now notoriously a place of consumption. Wallace tells us that Australia was the poorest zoölogical region on the globe. The only animals that existed on this island before its invasion by Europeans were a few marsupials. Previous to 1780 no ruminants existed there. In 1821, the Government becoming convinced of the great advantages of Australia as a grazing country, immigrants were allowed a grant of from 500 to 2,000 acres of grazing land, and rations from the king's stores were allowed to each settler; a certain number of convict servants were alike apportioned to them. They were also allowed a certain number of cattle from the Government herd, and a loan of money to be repaid in seven years. This was the beginning of the cattle raising, and it proved so successful that in 1826 the Australian Agricultural Company commenced its operations, which was the origin of the sheep and cattle mania. A drouth, beginning in 1827 and lasting for three years, cured the mania. But within a year after the drouth, cattle became so plentiful that meat of the best quality was sold for $1\frac{1}{2}$ cents a pound. In 1833, good cattle could be bought for \$4 and \$5 a head. At the present time there are 3,000,000 inhabitants, and 8,000,000 cattle. Australia enjoyed a reputation for immunity from consumption, but, as Hirsch says, this has of late been shown to be a mistake. In New Zealand, phthisis has made terrible ravages among the Maoris,

and has been one of the chief causes of the gradual extinction of that race. Both Hirsch and Evans, quoting Grant, say, that on the Island of Madagascar consumption is as common as it is in any part of Europe, and rapidly fatal. The principal diet of the natives is meat, milk and rice.

The natives of Great Kabylia, according to Hirsch and Evans, enjoy an almost absolute immunity from phthisis. According to the history of the people, there is no evidence of the presence of the bovine tribe among them; but they possess large flocks of sheep and goats, and each family has usually one buffalo ox to do the plowing. As these are a peculiar people, with peculiar ideas and peculiar habits, not calculated to encourage visits from European invalids, they retain their immunity from phthisis to the present day. There are many countries furnishing statistics of death rate from phthisis where the disease is not indigenous, but due to importation. Edmond About, in his book on "Greece and Grecians," tell us that the town of Athens possesses only five or six cows; no other milk is drank than that of the sheep; their butter alone is eaten. They eat meat but once a year. The entire population eat meat at Easter for the whole year, and this meat is lamb's. The disease is very rare in that country. (Roser.)

Prof. James Orton, of Vassar College, who made a scientific expedition to the equatorial Andes, in 1867, under the auspices of the Smithsonian Institute, says: "At Quito, the highest city in the world, suddenly we are looking down into the valley of Chimbo; there are herds of cattle and fields of grain, yet we shall not find a quart of milk or a loaf of bread for sale. The people insist on first boiling the milk." Professor Orton further says consumption is unknown in the city.

Without going into further details respecting separate communities, let us consider the statistics of Europe, and there we find the prevalence of phthisis is regulated by the ratio of the bovine to the human race. Thus, in Ireland, where the cattle number 4,570,000 nearly an equal proportion to that of the inhabitants, according to Doctor Wylde, phthisis is by far the most fatal affection to which the inhabitants of that country are subject.

In China, the people do not drink the milk of the cow, and they are free from phthisis.

Thus the statistics go on, and where the exceptions arise the cause is always evident in the conditions that influence the breeds of cattle.

Taking into consideration all the foregoing facts, there can be little doubt that the inbred species of the bovine race is the prime ætiological factor of phthisis in the human race. They not only nurse the germ, and prevent its extinction, but sow it in the human race continually and abundantly. Without their aid the germ would die, for of all germs known none have so hard a struggle for existence in the human kind as bacillus of tubercle, when we consider the comparatively few of the human race who are afflicted, and the immense number who are exposed to the infection and escape it. The cow is the only known animal that has transmitted tuberculosis to her offspring in inheritance. After looking through all the works at my command, and making inquiries of prominent doctors, I fail to find a well-authenticated case on record of a human foetus at term showing evidence of tuberculosis. At the congress for the study of tuberculosis, held in Paris, in July of the year 1888, it was stated, and generally accepted by the members, that a large portion of sufferers of phthisis acquired the disease through the ingestion of infected milk or meat. When we come to consider the transmission of the disease through the use of milk and the ingestion of diseased meat, we reach a point of vital importance to every man, woman, and child, and the conviction that the consumption of milk of phthisical cattle constitutes a veritable danger is daily gaining ground.

Since holding my present position, as veterinary inspector for the Bureau of Animal Industry at Armour Packing Company, I find upon post mortem that the udder is more often affected than any other organ of the body, and always in cows with fine, large udders, and those that look high bred.

At this period it seems to be customary to rear children on cows' milk. I therefore think it time that health departments had a regular inspection of all dairies. We have a so-

called milk inspection in the large cities, but the adulteration of milk with water and the skimming of cream cannot compare with tuberculosis in milk. As tuberculosis is difficult to diagnose in the early stage, I propose that a sample of milk from each cow be microscopically examined, and then the cow examined by a qualified person. By taking these precautions I think we could, in a measure, improve the health of the people, as well as that of our domestic animals.

REPORTS OF CASES.

OSTEO-POROSIS WITH FRACTURE OF BOTH NAVICULAR BONES, BREAKING DOWN OF PERFORANS AND PERFORATUS AT THE OS-PEDIS, IN POSTERIOR EXTREMITIES.

By C. N. DARKE, D V.S., Guttenberg, N. J.

I was called on April 14th to see a valuable running mare six years old unable to get up; with the history that she had been down five days, and that five weeks previous, while working a trial on the track, she had a very severe fall. She got up and walked to the stable apparently all right. The next day a large cyst formed at the point of the sternum; this the owner punctured and allowed contents to escape; but as it did not do very well, the owner called in a veterinary from New York city, who inserted a seton; but as the mare became very irritable in a few days, owner withdrew seton, the wound healed up all right, mare was again put on the track. On the 9th of April trainer found mare unable to rise; he informed owner, who did not call me till as stated above.

On arriving at stall, found a bay mare six years old unable to rise, eating and drinking, with a small amount of abdominal pain; inquired about faeces and urine; was informed that urine was passed regular, but faeces were very hard and passed with difficulty. On examining head, I found on the lower jaw a little anterior to first molar, and on the external face on each bone, a circumscribed swelling about half the size of a hen's egg, not painful on pressure. The owner informed me that they had been there for about three years, and that a colored boy who exercised her at that time had a habit of

yanking the mare while working her on the track to such an extent that he finally discharged him for it. The swelling appeared at that time and seemed to grow to about its present size, and was the same in size now as then to him; also, that it never seemed to cause her any inconvenience; otherwise the head to me seemed normal.

The shoulder and hip joint were very hot and painful on pressure, and when turned over the hair around the two corresponding joints was very wet. The knees and hocks seemed all right. Both anterior fetlock joints were swollen, hot and painful on pressure; both posterior fetlock joints and the hollow of the fetlock were very much swollen, hot and extremely painful on pressure; also the interstices between heels were broken open, and there exuded a serum-like synovial fluid. Temperature, 102° F.; pulse, 48.

I informed owner that I thought mare was broken down, but that I could tell better when I put her in slings. I prescribed the following:

R Olei lini, 3 vi,
Aloes Barb., 3 vi,
Hydrarg chlor. nitis, 3 i,
Pulv. nucis vomicæ, 3 i,
Pulv. zinzib. rad., qs.
{ M. et fiat haustus.
{ Sig.—As directed.

I ordered hot-water enemas with castile soap, and left. Returned about three hours later with slings. The animal was hoisted to her feet. She stood all right and quiet on hind legs, but trembled so violently in forward legs that she had to be lowered, then breaking out in a profuse perspiration. I examined the fetlock joints of both anterior extremities, but beyond being a little swollen I could detect nothing. As the animal stood so well on the hind limbs I did not bother with them, and gave up the idea of break-down. On inquiry of owner when animal was last sick, he informed me that last summer she was laid up for over two months with inflammatory rheumatism. As all the joints seemed hot and painful on pressure (temperature, 102° F.; pulse had gone up to 60),

I made a diagnosis of inflammatory rheumatism. This seemed to please the owner very much, as here was a chance to recover. I ordered enemas kept up every once in a while Prescribed

Rx Potassii sodi, 3*i.*
Potassii nitratis, 3*iv.*
} M.—Talis dos. No. xviii.
} Sig.—One three times a day.

Also belladonnæ linimentum to swollen joints, and then bandaged.

Saw mare next day, 15th, resting quietly, but seemed to have a little abdominal pain, manifested by turning head around to side and giving a slight sigh. Temperature, 102 F.; pulse, 48; bowels not yet open.

Called again on 16th. Seemed about same, but as bowels were not open yet, ordered olei lini, one pint, administered, enemas being still kept up.

Called again on 17th. Purgative had not acted as yet. Ordered olei lini, one pint. Still seemed to have slight abdominal pain. Little increase in temperature; pulse about same.

Called again on 18th. Mare eating. Pulse, 46; temperature, $102\frac{2}{3}$ F. Still had abdominal pain very slight. Fæces passed, but hard and coated with a thick mucus, not foetid, and of a blaek color.

Called on 19th. Owner said mare had stood up for fifteen minutes that morning, trembled for a few minutes, then it ceased; they cleaned out box and bedded her fresh and she then laid down again. Temperature, 102° F.; pulse about 42, but still had a little abdominal pain; was eating; fæces were passed hard and dry, coated with mucus.

I was sent for in a hurry about six o'clock on evening of 19th. The mare was struggling very violently when I reached the stall. Temperature, 106° F.; pulse, 80. I gave morph. sulph. hyperdomically, and tinct. opii by mouth and rectum, but I could not quiet the animal; she would struggle violently for about ten minutes, then rest about the same; this she kept up until she expired at 11.50 P.M.

Held post-mortem next morning. Heart was of a pink color, easily torn, with fibrin around the semi-lunar valves of the aorta. The liver was a putrid mass, very soft like jelly; I could press my finger right through its substance without resistance, with small nodules studded here and there on its surface. In the vicinity of the liver there was peritonitis; this no doubt was the cause of the abdominal pain, and the liver trouble the cause of the continued constipation. There was no sign of jaundice at any time present. On cutting down upon the exostoses on lower jaw bone they seemed quite hard; I could not cut them. Both shoulder joints were ulcerated in patches on its surface. Anterior limbs and tendons seemed to me natural, swelling excepted. Coxo-femoral joints had a few small ulcers. Fetlock joints were also natural, swelling excepted. On removing the soles of the hind feet I found a breaking down of perforans and perforatus, fracture of both navicular bones, disease of os pedis, and ulceration of the inferior extremity of the os suffraginis. I then turned both hind feet over to Dr. Liautard, who had them boiled out, and told me I had a nice case of big head on hand.

RESISTING POWER OF THE ANIMAL ECONOMY.

BY CLAUDE D. MORRIS, V. S., Brooklyn, N. Y.

In the early part of May, shortly after my connection with the Bureau of Animal Industry in this city, while attending to my regular duties making post-mortems at the slaughter houses, a certain cow was placed upon the bed and dressed. Upon removing the lungs and heart, the latter was noticed as being extraordinarily large. An examination revealed the wonderful resisting power the animal economy is capable of undergoing when the seat of attack was one of the most vital organs of the body.

The cow had at some time in the past swallowed a wire nail, three inches in length. The nail had found its way into the reticulum; there it pierced the anterior wall in the cul-de-sac portion of the stomach, forced its way through the diaphragm, entered the right lung, and when found it

was lodged in what was formerly the pericardium, but at the time of the examination had become a thick mass of fibrous tissue. On the right side of the heart a large sinus had formed, extending from before backward, and from base to apex, the walls of which were covered with a thick layer of disintegrated pus; no pus was present in the form as usually seen. There was considerable fetor upon opening the sinus.

The mass surrounding the heart was variable in thickness, some portions being about an inch, other portions nearly three inches in thickness.

The parenchyma of the heart to all appearance was unaffected. The endocardium valves and chordæ tendineæ showed no signs of disease. There were considerable adhesions both of the diaphragm and pericardium. The posterior lobe of the right lung showed signs of previous inflammation, and the path of the intruding agent was easily followed. I do not place the history of this post-mortem before the readers of the REVIEW without feeling to a certain degree that perhaps some will not give it the credulity it deserves. To the casual observer, and I may say examiner, this animal outwardly presented no indications of organic disease. She was in good flesh, with a sleek coat of hair.

EXTRACTS FROM FOREIGN PERIODICALS.

ORIGINAL WORK BY RUSSIAN VETERINARIANS.

CONTRIBUTION TO THE STUDY OF SPONTANEOUS RECOVERY FROM GLANDERS.

BY M. NONIEWITSCH.

The author reports several cases of the spontaneous recovery of glanderous horses. According to the conclusions of Mr. Meyrick, such a recovery is the result of the weakness of the contagion, which may give rise to local manifestations upon the septum nasi, and in the submaxillary glands, without infecting the entire organism. M. Noniewitsch has noticed an interesting case in a mare four years old,

which was used for experiments in the bacteriological institute of Dorpat. This animal, when but six months old, was inoculated under the skin of the right nostril, and that of the scapular region, with a virulent liquid obtained by squeezing the liver and spleen of a guinea-pig which had died from glanders.

Nine days after the injection, together with other symptoms, a greasy ulcer appeared on the nasal septum, surrounded by nodules of a grayish-yellow color; also inflammation of the right submaxillary glands, and an abundant discharge from the mouth and ocular regions.

Two months later the patient was very weak, continuing in the recumbent posture. The inoculation of other animals with virulent matter gave positive results. During the entire continuance of the disease the temperature remained at about 39°.

After a while the symptoms began to abate, and a month later the mucous of the nasal cavity had resumed its normal aspect.

On the 8th of March following, or about six months after, a subcutaneous injection of oleum terebinthina was made, according to Cagny's method. Outside of the œdema following, nothing abnormal could be discovered, and up to the 7th of April the mare was apparently in good health. On that day injections of virulent matter were made as follows, by means of excoriations made with a scalpel upon the right side of the septum nasi; and also, the same process being used, by frictions upon the frontal region; and for the subcutaneous injection of the nostril, virulent matter mixed with a physiological solution of natr. chloro., previously filtrated, was used. For this injection a cubic centimeter was employed. Inflammatory symptoms soon appeared at the points of inoculation, and the microscope disclosed micrococci in the pus, the tumor in the nostril becoming enlarged and warm.

April 11th, all the symptoms were diminished, and by the beginning of May the tumor had disappeared. The maximum of temperature of the mare remained about 38.8°.

On the same day, April 7th, and with the same virulent

matter, and at the same places, subcutaneous injections were made on an old horse, and on the 19th of June he died with glanders.

A third injection of the same mare was made with a pure culture of bacillus mallei, of the third generation, obtained from the spleen of a guinea-pig which had died from glanders; the injection being made at the same places and in the same manner. A friction of pure culture, weighing about one grain, on potatoes, was made upon the frontal excoriations, and the quantity of virulent matter, mixed in two cubic centimeters of a sterilized physiological solution of natr. chlor. was used for an injection under the skin of the nose, alongside the nostrils. The pus of the abscess which had formed, examined by the microscope, and the preparation tinted with an alkaline solution of violet methyl of Loffleur, showed several rods of glanders (bacil. mallei.). The condition of the general health varied much, being at times bad, but at others changing for the better. The temperature varied between 40.5° and 39.7°.

On the 25th of September an injection of oleum terebinth was administered, by the Cagny method, but the result was negative, being quite without reaction or morbid changes.

To prove the diagnosis of glanders as transmitted, a third time, to the mare, a dog was inoculated and gave positive results, and was killed, showing at the post-mortem all the organs healthy except the spleen. Pure cultures of bacillus mallei were obtained, with a selected portion of that organ, and besides this experiment two pigs were inoculated, with positive results, by the virulent matter of the abscess of the mare.

On the 24th of October three inoculations were made in a pup and two guinea-pigs, with the discharge from the nostrils of the same mare, but produced no results.

The conclusions of the author are as follows:

1st. In chronic glanders the bacillus mallei of Schutz and Loffleur may be absent, but in their place are found micrococci forming clusters, which under a weak microscopic power may be mistaken for rods. These micrococci present

the last stage of bacillus mallei—that is, they are so weakened that they lose their glandorous process upon an impressionable animal, or otherwise die entirely.

2d. The glandorous process may take effect in a horse several times (as three times in the case above cited), and yet the health of the animal inoculated with the non-attenuated virus remains normal; that is, the horse will have sustained a secondary malleisation.

3d. According to Loffleur and St. Cyr, a first inoculation of glandorous virus has a repressive influence upon a second.

4th. According to the theory of the author, horses may be insured against glanders after several inoculations of virulent matter.

5th. Spontaneous recovery of glandered horses may take place.

The glanderous process (*malleus humidus et farcinosus*), as well as that of syphilis in man, may be under a latent form, and horses affected with that form of glanders cannot communicate their disease to other horses.—*Arch. en Scien. Vet., St. Petersburg.*

FROM SOCIETY PAPERS.

INOCULABILITY OF DOURINE.

BY PROF. E. NOCARD.

Having noticed the virulence of the spinal cord in this affection, Prof. Nocard had proved to himself that the disease was inoculable to dogs. He had noticed that several of these animals which had been inoculated with a small quantity of mucous matter taken from a softened part of the cord of a dourined horse had subsequently died in from six to eleven weeks after the injection, after also noticing the existence of paraplegia or monoplegia associated with a well marked progressive loss of flesh. Since then he has often developed the disease in dogs, and has observed that the virulence of the cord could be preserved for a long time by immersing it in pure and neutral glycerine, as is done by Mr. Roux with the brains and cords of rabies.

The greatest obstacle to progress in the study of dourine heretofore has been the necessity of having horses for the purpose, and the difficulty of procuring dourined animals in sufficient numbers for experimentation. In the future, however, cases will be collected and preserved, to furnish material for experiments on dogs, and in this way it is likely that at an early day the pathogeny of the disease will become better known.

FROM FRENCH JOURNALS.

DOSIMETRIC MEDICINE IN CANINE PATHOLOGY. ACUTE BRONCHITIS.

BY MR. H. JACOTIN.

A small pet-dog had taken a severe cold. He had chills, was dull with loss of appetite, nose dry and warm, constipated, painful cough, high fever, difficult breathing, mucous rales.

The diagnosis was evident, and the prognosis quite serious on account of the delicate constitution and the small size of the animal.

Treatment: A teaspoonful of sedlitz Chanteaud in the morning on an empty stomach; at intervals, Rigolot's mustard plasters on the flat of the thigh; aconite, brucine, three granules a day; arseniate of antimony, four granules. Animal kept warm; food *ad libitum*—milk, soup, meat, etc.

Carefully carried out during three days, this treatment was followed by the almost jugulation (abortion) of the disease.—*Rev. de Med. Dosim. Veter.*

AMAUROSIS.

BY MR. A. MANSUY.

A watchdog for several days seemed not to see as closely and as well as before, knocking against the walls and the doors and the furniture of the room. When examined he appeared by his actions to have lost much of his sight, if not to be entirely blind. The eyes seemed to show nothing very peculiar, except an abnormal dilatation of the pupils, which contracted somewhat, however, when the patient was brought to a strong light.

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The diagnosis established, the animal was placed under granules of arseniate of strychnia and of aconitine, of which he received one of each twice a day for two days, the dose being doubled on the third day until all were used.

On the fourth day there was but little change, though the patient seemed to act better when in the open air than in the room. The same treatment was continued with the strychnia, the aconitine being replaced by the nitrate of pilocarpine.

Two weeks later, though the improvement continued, the sight was not yet perfect. A purgative was administered, and two or three days after, repeated. This gave rise to some peculiar symptoms of pain. The strychnine and pilocarpine were kept up for a week or so longer, stopped then for a few days, and started for a week longer. After this the sight entirely returned, and the animal became able to perform his duties as watchdog.—*Ibid.*

DOUBLE ACUTE PNEUMONIA.

BY MR. L. MESNARD.

A dog three years old became affected with a great difficulty of breathing. He was dull and drooping, had no appetite, temperature, 39.3°. Upon auscultation, all the symptoms of double acute pneumonia were present and well marked. He was immediately placed under treatment, with aconitine, veratrine and digitaline, two granules ($\frac{1}{2}$ of a milligram) a day, in a small piece of meat. Two days later the dog was more cheerful and had a little appetite. He had, however, a hard, painful cough, for which he received two granules of codeine with the preceding treatment combined. Recovery occurred in a few days.—*Ibid.*

SERIOUS ATTACK OF JAUNDICE.

BY THE SAME.

An Irish setter, about three years old and very valuable for hunting purposes, had lost his appetite and was very dull. Two days before he swam across two rivers. When seen he was not willing to move nor to answer the calls that were

made to him. The mucous membrane had an icteric hue well marked, and the diagnosis was simple.

Treatment : Two granules of hyoscyamine, one of brucine and one of digitaline, the three together every two hours with black coffee mixed with carrot bouillon.

No change appeared on the next day, and a large sinapism was then applied under the abdomen, but principally toward the liver, to be left on four hours; the same medicine to be continued.

The next day improvement was evident, which continued until recovery, four days later.—*Ibid.*

ACUTE MENINGITIS.

BY THE SAME.

A Newfoundland dog, four years old, had refused his food for one day, and moved about in his kennel in a manner so strange that his owner began to fear rabies. He howled occasionally, but not with the characteristic howl of rabies, and when lying down and urged to get up, he did so complainingly and with faint, painful groans. When on his feet he stood with his head hanging down. His eye was dull and partly closed and the walk trembling. He refused all kinds of food, and no efforts that were made were sufficient to excite any manifestations of a rabid state. It was a simple case of acute meningitis, and for treatment, aconitine, veratrine and digitaline were prescribed, one granule of each every two hours,

No change appeared the next day, unless perhaps the convulsive movements had abated. These disappeared the following morning and the standing became firmer, the walk better, the appetite improved.

The treatment was continued for five days longer, and was followed by a radical recovery.—*Ibid.*

PARAPLEGIA.

BY MR. P. BON.

A bitch which had nursed puppies for five weeks, was suddenly attacked with paraplegia. Every pup died a few days

later. The mother was dull, fed but little, moved only by dragging her hind quarters.

The prescription ordered was one granule of sulphate of strychnia every hour, hyoscamine one granule every two hours, and every morning, milk containing a little sedlitz Chanteaud.

On the second day little or no change could be noted. Hyoscamine was continued and arseniate of strychnia prescribed in place of the sulphate, and, in addition, one granule of salicylate of quinine was given every six hours. Within forty-eight hours there was marked improvement.

The next day the patient tried to get up alone, and if assisted and standing she could take a few steps. The granules were then given every two hours, again diminished, and then discontinued, and in twenty days recovery was complete.

—*Ibid.*

FROM GERMAN JOURNALS.

BY R. MIDDLETON, D.V.S., Philadelphia, Pa.

A PECULIAR DISEASE OF SWINE.

There appeared in Rodingen toward the end of August, 1891, a peculiar and at once pernicious disease of swine which developed the following characteristics: The victims were invariably of the female sex, and in the diversified stages of pregnancy. The animals reclined quietly, refused food, and evidenced somewhat accelerated and difficult respiration. In twenty recorded cases the temperature varied from $101\frac{1}{2}$ ° to 103° F., and pulse 90 to 120. The posterior extremities were apparently involved in a paralyzed condition, which involved the rectum and bladder to such an extent as to preclude their use by the patient.

Clysters of irritating substances had no effect upon the mucous membrane of the bowels, which was constantly filled with feces. Catheterization yielded a urine, normal in color and consistence, though somewhat increased in quantity. Locomotion of an uncertain and unsteady gait was possible,

but the animal's volition apparently exercised no control of the hind limbs. The disease lasted from two to ten days; discoloration of the cutis was not noticeable. Recovery was seldom, and only occurred in those cases where the patient retained the government of rectum and bladder. Upon post-mortem, nothing in the nature of a pathological lesion was remarked, but in the several cavities from two to fifteen quarts of an amber-colored coagulable fluid was collected. Most of this was obtained from the thorax and lungs, the latter showing numerous emphysematous localities and interstitial tissue swelled by the liquid referred to. The remaining apparatus of the thoracic and abdominal cavities displayed no alterations discovered by the eye or microscope. Colon always filled with dry feces. Treatment was without result, and animals recovered that had not received therapeutic consideration—*Woch. fur Thierheilkunde.*

THERAPY OF PENETRATING WOUNDS OF THE HOCK.

A horse of the army which had received a blow upon the tibio tarsal articulation exhibited a puncture of the same, with small quantities of escaping synovia, but little or no swelling.

The wound, after being well cleansed and dusted with iodoform-tannin, was neatly closed by a small tuft of cotton. Adjacent to the wound, the cutis received a coating of unguicantharid. Later the cotton was removed and in its stead we endeavored to obliterate the puncture by repeated applications of iodoform-collodion. After two hours patient applying, the gentle oozing of secretion (synovia) had disappeared, and a tenacious covering secured. After the lapse of a few days the patient was discharged, and again resumed the march.

Also in two other cases where the same cause produced the same effect, the results were equally favorable. In one of these the animal could not be left behind, the lameness assumed painful proportions. The march came to an end at the termination of fourteen days, and the patient was given

the usual application of ungu. cantharid.; absolute quiet was enjoined. The articulation remained thickened, but recovery was attained.—*Ztschr. f. Vet. K.*, iv.

ZINCUM CHLORIDUM IN VETERINARY PRACTICE.

Since bandaging of the upper portion of the extremities and loins in the larger domestic animals is of great difficulty, it has been recommended to irrigate the wounds at these points with zincum chloridum. For this purpose the saturated solution, and not the crystallized product, are in requisition. The latter is a solution of the metal in hydrochloric acid, of the strength 1:3; this liquid is further diluted with water sufficient to double the amount. A ten per cent. solution in conjunction with zincum oxidum is a successful method of treating abraded injuries upon the gluteal muscles.—*Thier. Woch.*

THERAPEUTIC NOTICES.

As an anti-itch application, Klein prescribed a salve of the following ingredients :

R Lanolin, 3 ijj,
Vaseline, 3 v,
Ag. Destill., 3 vi,
M.

Sig.—Apply to part every three hours.—*Berl. Woch.*

Prof. Demme, of Bern, suggests sod. cantharid. to be used in slowly granulating wounds from scalds or burns. He injects subcutaneously every third or fourth day sod. cantharid. gr.; six to eight hours subsequently the wounds so treated exhibit a hyperæmic appearance, and are moist.—*Berl. Woch.*

Journ. de Med. Paris recommends for fetor of the oral cavity these two prescriptions, which are to be used as ordinary collatorium :

B Thymoli, gr. viij,

Boracis, gr. xv,

Alcoholis, f. 3 ss,

Ag. Destil, 3j,

M.

B Ac. Salicylici,

Saccharini,

Sod. Bicarb., aa 3 jss,

Alcoholis, 3 v,

M.

Sig.—3 j dissolved in glass of water.

Reuter, of Carlstadt, recommends lysol as the most effectual and safest disinfectant for the treatment of aphthæ epizooticæ, or foot and mouth disease. For the feet he uses a salve made from 365 parts of lysol, 10 carbo. liqui and 100 of vaseline, to be applied twice or three times daily. The stomatic ulcers and those upon the tongue were three times per day subjected to a three per cent. to five per cent. lysol salve, which in aggravated cases also contained alum. The stalls and appurtenances were likewise cleansed in a three per cent. lysol solution. As a prophylactic measure, animals not manifesting symptoms of the disease were also treated to washing of the oral cavity and feet in a five per cent. lysol solution.—*Landw. Presse*.

FROM ENGLISH PAPERS.

HOW TO PREVENT TUBERCULOSIS IN CATTLE.

Professor M'Fadyean says: Even supposing that tuberculosis, like pleuro-pneumonia, were a disease peculiar to cattle, it would be a matter of the gravest concern to know that 20 per cent. of our dairy cows are affected with it; but still greater misgivings are excited in one's mind when it is remembered that tuberculosis is the same disease as that which is commonly called "consumption" when it attacks human beings.

In both species the disease is called by the same bacillus,

and every case of the disease has its starting point in the introduction of one or more of these germs into the body of the individual attacked. It is quite permissible to maintain that the danger of the transmission of tuberculosis to members of the human race through the eating of meat or drinking of milk from tuberculous animals has been exaggerated, but the danger certainly exists, and to a degree that gives human sanitarians a right to urge the necessity of devising measures to check the spread of the disease among cattle. But even without that, the great loss which the disease inflicts on farmers and dairymen is surely sufficient incentive to do whatever is feasible in the way of prevention. And that raises the question, Is tuberculosis a preventable disease?

To this question an affirmative answer may be given without hesitation. There are one or two very well known, but generally misinterpreted, facts that have an important bearing on this question. Why are cattle, above all other domesticated species, the victims of tuberculosis? Not altogether, as some suppose, because their tissues furnish a specially suitable soil for the growth and multiplication of the tubercle bacillus. Sheep are so rarely the subject of tuberculosis that it is doubtful whether any natural case has been observed in this country, and yet we know that when attempts are made to infect sheep with that disease, the experiment succeeds well enough. Again, both experiment and observation have shown that the tubercle bacillus, when once it gains entrance to the system of a horse, is capable of setting up a deadly form of the disease, and yet the proportion of tuberculosis among horses is insignificant. These facts suggest that the prevalence of tuberculosis among cattle may be less due to any inherent susceptibility of the ox tribe than to something in man's method of keeping these animals. May it not be due in great measure to the fact that cattle, particularly dairy cows, as they are commonly kept in this country, are found in circumstances specially favorable for the transmission of the disease from the affected to the healthy animals? No well-informed person now imagines that overcrowding can generate tuberculosis; but what everyone must see is that

the more constantly animals are housed, and the smaller and worse ventilated the buildings are in which they are confined, the greater will be the risk of the disease spreading, provided there is one tuberculous individual in the stock. A cow that is the subject of tuberculosis of the lungs expels tubercle bacilli from the air passages in the act of coughing. These bacilli, when desiccated, rise as particles of dust, they are then apt to be inhaled by other inmates of the same building. Such in the great majority of cases is the mode of infection in the case of cattle, and hence the two main things to be attended to with a view to prevention are—(1) To permit no animal suspected of being tuberculous to stand in the same building with other animals; and (2) to see that the buildings in which cattle, and especially dairy cows, are housed, are roomy and well ventilated. To provide sufficient air-space and adequate means of ventilation in the most obvious manner diminishes the risk of one animal infecting another. No wild animal in a state of nature has ever been known to die from tuberculosis; and, with the exception of the few cases in which the disease is inherited, or transmitted to the calf by means of the milk, cattle of even the most susceptible breeds remain free from tuberculosis as long as they are not housed. In short, tuberculosis is a disease of domestication—of close housing and bad ventilation.

Long before the discovery of the tubercle bacillus, and even before it was generally recognized that tuberculosis is contagious, medical men had come to the conclusion that insufficient ventilation had much to do with the prevalence of the disease among human beings, and a most convincing proof of the correctness of their view was furnished by the sudden decline in the mortality from phthisis among our soldiers when a greater air-space per man and better means of ventilation were provided in the barracks. There is every reason to believe that, in like manner, a great check would be put to the spread of the disease among cattle if byres were made larger and better ventilated.

Sanitarians are agreed that in ordinary human habitations a cubic capacity of 600 to 800 feet should be provided for

each individual; and where, as in hospitals, the apartments are occupied during the whole twenty-four hours, 1,000 feet is considered not too much. And yet it is reported that some county councils and the local authorities are hesitating about fixing the cubic space for dairy cows at 800 feet, and some have actually recommended that this may be as low as 450 feet. Government has already been urged to apply radical measures for the suppression of bovine tuberculosis, and some do not hesitate to recommend the system of slaughter and compensation now in force against pleuro-pneumonia. The ratepayers may form some notion of what this would cost the country if 10 to 20 per cent. of adult cattle are already attacked, and if byres, from insufficient space and defective ventilation, are to remain veritable hot-beds for the propagation of the disease.—*Veterinary Record*.

THE OFFORD ELBOW PAD.

According to the *Veterinary Record* (England), this new contrivance is one of the best of all the appliances known, designed for the relief of horses affected with that annoying trouble known as lapsed elbow.

All sorts of pads have been invented with a view to obviate the evil of pressure on the injured part, but all have failed to give satisfactory results, and animals which are liable to suffer from the injury in question are still, now and then, laid up disabled for various periods of time. The new invention is due to a layman, and according to those who have used it it is incomparably the best of its kind.

It consists of a long pad, slung from above, in such a manner that it hangs just under the sternum, extending rather beyond both elbows. Its action seems to be to effectually protect the elbow from pressure while the horse is lying down, and thus to cause the disappearance of the unsightly tumors by gradual absorption.

Those who have used this pad affirm that their experience justifies them in saying that it has given them entire satisfaction, and that it acts equally well in cases where both elbows

are affected as when the trouble is unilateral. It causes no discomfort to the animal, and does not prevent him from lying down.—*Ibid.*

DIABETES MELLITUS IN A HORSE.

BY THOMAS WALLEY, M.R.C.V.S., Principal of the Royal Veterinary College, Edinburgh.

While diabetes insipidum (polyuria) is of very common occurrence in the horse, the graver form (d. mellitus) is very rarely met with, or perhaps it would be more correct to say that it is seldom diagnosed : consequently, the relation of an indubitable case may be of interest to the veterinary surgeon.

With the exception of the occurrence of sugar in the urine of azoturic patients I have not hitherto met with a case in which I had reason to suspect that sugar was present in the urine.

On the 6th May, 1891, I was requested by Mr. D. to examine an aged chestnut hunter, and to give my opinion as to his condition.

HISTORY.—The owner stated that the horse had been ill for some time, that he had observed that whenever he mounted him the animal seemed to yield under his weight, that although in good spirits at the commencement of his work, the horse appeared to become abnormally fatigued after exertion, that he had lost condition, and that he had been under the care of Mr. John Aitken, Dalkeith.

Eliminating by enquiry the probabilities that the illness was due to worms, indigestion, or diabetes, I proceeded to make a careful examination.

The symptoms presented were, unthriftiness of the skin, which was dry and tolerably firmly adherent to the underlying tissues ; the coat dry and harsh ; pulse 60, wanting in tone but regular in rhythm ; temperature 103° F.; respiration normal ; visible mucous membranes injected and somewhat icteric.

The muscular wasting was most marked in the lumbar region. Suspecting renal mischief, I withdrew (and collected)

the urine then contained in the bladder, and on its withdrawal I observed that it was of a pale primrose color. In the absence of any positive symptom it occurred to me that the case might be one of diabetes mellitus, and an analysis carried out, under the guidance of my colleague, Dr. Aitken, by Greig Smith verified my suspicion, sugar being found in tolerable quantity.

TREATMENT.—Reasoning that the diabetic condition was in all probability due to derangement of the liver and to indigestion and mal-assimilation, I advised that the horse be put on a diet of bran, linseed, and malt mashes, with skim milk, and that he should receive daily a dose of nitro-muriatic acid and inf. of quassia, with a dose of aloine every third day at noon. I saw the horse only once afterwards at Mr. Aitken's stables, on which occasion he did not show any signs of improvement.

Subsequently, as no progress towards recovery was made, the owner of the horse expressed his intention of shooting him, but Mr. Aitken persuaded Mr. D— to turn him out to grass and give him another chance. He was accordingly put out to graze during the day and stabled at night, and although at that time he could scarcely walk to pasture he eventually improved, although very slowly, and in the middle of February the owner informed me that he was in good condition and doing his work well. In answer to my inquiries Mr. Aitken, Jr., subsequently stated that the animal had for several years suffered from repeated attacks of polyuria, these attacks being most observable after a day with the hounds, and that the polyuria was usually checked by the administration of a few doses of tonic medicine with or without iodine.

Mr. Aitken further informed me that in 1890 the animal had an attack of influenza (pink-eye) followed by pleurisy, after which irremediable diabetes set in.—*Journal Com. Path. and Ther.*

SANITARY BULLETIN.

EXTRACTS FROM STATE VETERINARY REPORTS.

ILLINOIS—*Actinomycosis*.—The following tables, obtained from the annual report of the Board of Live Stock Commissioners for the State of Illinois, exhibit fully the extent to which that disease prevails among the cattle of that region:

ANIMALS AFFECTION WITH ACTINOMYCOSIS, ISOLATED AT THE UNION STOCK YARD AND SLAUGHTERED.

MONTHS.	Number isolated.	Number released.	Number affected and slaughtered.
1890. November	280	8	272
December	203	4	199
1891. January	182	12	170
February	119	9	110
March	129	5	124
April	100	12	88
May	155	7	148
June	150	12	138
July	217	15	202
August	186	16	170
September	223	13	210
October	315	20	295
Total.....	2,259	133	2,126

ANIMALS AFFECTION WITH ACTINOMYCOSIS, ISOLATED AT THE NATIONAL STOCK YARD AND SLAUGHTERED.

MONTHS.	Number isolated.	Number released.	Number affected and slaughtered.
1890. November	10	....	10
December	8	2	6
1891. January	9	....	9
February	6	....	6
March	7	1	6
April	4	1	3
May	9	1	8
June	9	....	9
July	13	....	13
August	12	1	11
September	17	....	17
October	27	....	27
Total.....	131	6	125

TABLE OF STATES, WITH THE NUMBER OF CATTLE AFFECTION WITH ACTINOMYCOSIS SHIPPED THEREFROM TO THE UNION STOCK YARD, CHICAGO.

	MONTHS.		Illinois.	Iowa.	Wisconsin.	Missouri.	Kansas.	Minnesota.	Texas.	Nebraska.	Indiana	Michigan.	Ohio.	Colorado.	Kentucky.	Dakota.	Totals.
1890.	November	..	35	54	23	22	21	20	52	21	11	8	5	..	..	..	272
	December	..	29	44	24	17	19	22	12	9	10	7	6	..	..	..	199
1891.	January	..	23	34	21	15	17	19	..	14	11	9	7	..	..	..	179
	February	..	22	30	18	8	10	10	..	5	6	4	2	..	..	..	110
	March	..	23	32	14	10	9	10	2	9	7	6	..	..	..	..	124
	April	..	16	24	12	..	9	10	..	8	4	3	..	..	..	..	88
	May	..	26	37	19	10	11	15	5	12	8	5	..	..	..	..	148
	June	..	18	26	15	13	11	14	29	9	3	..	..	..	..	..	138
	July	..	2	39	20	13	12	15	27	17	5	..	..	20	9	..	202
	August	..	21	34	18	12	10	13	21	15	8	..	..	18	..	..	170
	September	..	26	37	23	20	18	21	23	17	8	2	..	..	15	..	210
	October	..	34	47	27	31	26	28	27	23	10	7	..	21	14	..	295
	Totals	..	298	438	229	171	173	197	198	159	91	51	24	59	23	15	2,126

Tuberculosis.—There were two outbreaks. In one county a herd of 60 cattle was inspected, of which nine were found affected, and three looked upon as suspicious. In another herd, 18 out of 24 were found by post-mortem examination badly diseased by Prof. Withers.

Glanders.—During the year 1891, 137 animals were found affected, and 467 had been exposed. The diseased ones were slaughtered, with five of the exposed ones. Average damages paid by the State being allowed for each diseased animal, \$33.83; and for exposed ones, \$73.00.

Dourine.—There have been no new cases in the State during the year, and there now remains but one diseased mare, and three suspicious cases in quarantine.

Pleuro-pneumonia.—There is none and no prospect of its appearance, if carefully watched for.

LOUISIANA.—*Anthrax* has been less prevalent than in the last two years. There have been but one or two isolated cases.

Rabies.—A pronounced case of rabies occurred in a horse during the year. He died exhibiting the most characteristic symptoms. There have been, however, a number of rabid dogs destroyed.

Glanders.—Several outbreaks have occurred. 62 horses and mules were affected and destroyed, all the carcasses being burned or buried, and all sanitary disinfecting measures applied.

MINNESOTA—*Glanders.*—The following report for February, 1892, shows a marked decline in numbers: Remaining on hand February 1, 30; reported during the month, 7; killed during the month, 7; released during the month, 16; remaining isolated, March 1, 14. Most of them are "suspects" and are kept under observation. The disease is steadily decreasing in the state.

STAFF OF STATE VETERINARIANS OF ILLINOIS.

J. CASWELL, V.S., State Veterinarian.

ASSISTANT STATE VETERINARIANS:

- Joseph Hughes, 2537 State Street, Chicago, Ill.
- A. H. Baker, 2537 State Street, Chicago, Ill.
- R. J. Withers, 2537 State Street, Chicago, Ill.
- A. Maguire, 1446 Wabash Avenue, Chicago, Ill.
- B. A. Pierce, 625 West Madison Street, Chicago, Ill.
- J. F. Ryan, 175 Michigan Avenue, Chicago, Ill.
- J. E. Hill, 101 West Adams Street, Chicago, Ill.
- Wm. E. McGarth, 625 North Madison Street, Chicago, Ill.
- L. C. Tiffany, Springfield, Ill.
- Walter Tomlinson, Alexis, Ill.
- C. A. Pierce, Elgin, Ill.
- J. F. Pease, Quincy, Ill.
- B. F. Swingley, Freeport, Ill.
- J. Stallman, Pontiac, Ill.
- J. J. Walker, Olney, Ill.
- O. J. McGurty, Paris, Ill.
- F. R. Rowan, Kirkland, Ill.
- A. G. Alverson, Bloomington, Ill.
- Chas. W. Johnson, Elburn, Ill.
- Matthew Wilson, Mendota, Ill.

J. F.
C. M.
W. A.
A. D.
James
P. C.
H. G.
W. F.
S. V.
James
A. J. Z.
Thomas
B. B. I.
J. C. B.
John C.
I. J. M.
Thoma
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John S.
F. H. A.

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J. F. Reid, Decatur, Ill.
C. M. Paxton, Kansas, Ill.
W. A. Baker, Gibson, Ill.
A. D. Melvin, Sterling, Ill.
James Bond, Streator, Ill.
P. C. Dodge, Rochelle, Ill.
H. G. Pyle, Jacksonville, Ill.
W. F. Weese, Ottawa, Ill.
S. V. Ramsey, Tuscola, Ill.
James Addison, Aledo, Ill.
A. J. Ziegler, Lincoln, Ill.
Thomas Hope, Waukegan, Ill.
B. B. Page, Rockford, Ill.
J. C. Booker, Carrollton, Ill.
John C. Stewart, Danville, Ill.
I. J. Miles, Charleston, Ill.
Thomas E. Feron, Bushnell, Ill.
J. D. Nighbert, Pittsfield, Ill.
John Scott, Peoria, Ill.
F. H. Armstrong, East St. Louis, Ill.

OBITUARY.

DR. WILLIAM R. BIRDSALL.

The medical fraternity of New York City will regret the loss of one of their members, Dr. W. R. Birdsall, as that of one of its most active and promising members, and some of the younger graduates of the American Veterinary College will realize an additional reason for regretting his loss by recalling the fact that for two years he lectured to them in the department of Helminthology.

NOTICE TO THE VETERINARY PROFESSION.

UNITED STATES VETERINARY MEDICAL ASSOCIATION.

The annual meeting of the United States Veterinary Medical Association will be held in Boston, September 20th, 21st

and 22d next. It will be our first meeting with a three days' session, giving assurance of a full discussion and consideration of all matters brought before us.

The unfinished discussions of our Washington meeting will be then completed, and all the preliminary work for our International Meeting in 1893, will be considered. Reports and papers will then be presented as follows, upon which a full discussion will be indulged in, which certainly will make an instructive and enjoyable session:

The most interesting and important Committee Reports. The food supply—an important topic. The veterinarians' position on the meat and milk supply of our land.

A paper by Dr. D. E. Salmon on the "Scientific Investigations of the Bureau of Animal Industry."

Original work in the field of "Rodents,"—important discoveries with a summary of the wide field opened for research, by Dr. S. E. Weber, of Pennsylvania.

"Veterinary Science in Agricultural Colleges and Experiment Stations," by Dr. W. L. Williams, Perdue University.

"Strongylus Armatus," by Dr. J. F. Winchester, of Massachusetts.

"Army Veterinary Cases," by Dr. D. Lemay, U. S. Army.

A paper by Dr. Tait Butier of Mississippi, on "Professional Ethics as related to business interests," and one or two others to be announced later.

Application for reduced rate of fare on all railroads has been made, and a royal reception is promised by our Eastern friends.

All State and local Associations should take immediate steps to have duly appointed delegates present.

By order of

R. S. HUIDEKOPER,

W. HORACE HOSKINS, *Secretary,*

President.

12 South 37th St., Philadelphia.

SUNDRIES.

UPON THE VALUE OF THE MEAT FROM TUBERCULAR CATTLE.—(Ueber die Verwerthung des Fleisches von tuber-

culosem Schlachtvieh. *Centralblatt f. Bakteriol. u. Parasitenk.*, Bd. xi., No. 14.)—Perroncito, who as early as 1874 and 1875 (*Ann. der kgl. Akad. f. Landwirthschaft in Turin*, Bd. xviii., 1875) stated his belief in the absence of any danger to those eating the flesh of tubercular animals from the transmission of the disease, calls up his former position to corroborate it from a richer experience. During 1890-91 he conducted an extensive series of experiments upon guinea-pigs, puppies, pigs, and horned cattle, which was summarized before the International Congress of Hygiene in London, and in the congress at Paris for the study of tuberculosis, during the last summer. The meat obtained from the public slaughter-houses in Turin was fed in several experiment groups to pigs, and the juices were injected into puppies, guinea-pigs, and cattle. More than two hundred puppies and quite as many guinea-pigs were subjected to these experiments, the meat-juice, or a watery extract of the meat, being injected subcutaneously or into the abdominal cavity. After intervals of six weeks, two, three, or more months, these animals were killed, not a trace of tuberculosis being evident. Two cattle were subjected to subcutaneous injection of the meat-juice, and when killed, six months later, showed no sign of the disease. Four pigs, six months old, were fed for four months on the flesh from tubercular cattle, without exhibiting the least evidence of acquirement of the affection. A litter of twelve pigs, aged two months, were fed for five months on the flesh from tubercular cattle; several died from other diseases, and the rest were all killed at varying periods, without any tubercular lesions being found. Two pigs were fed for three months on flesh from tubercular animals, and afterwards fed with tissues in various grades of tubercular changes; when killed they showed not the least evidence of having acquired tuberculosis.

GREAT MORTALITY AMONG HORSES IN RUSSIA.—The terrible famine which has prevailed in Russia since last Autumn, producing such dreadful results among the human population, has been also very disastrous to horses. In the British consul's report on trade and commerce in Taganrog, just issued from the Foreign Office, in reference to the effect of the

famine, mention is made that up to last January it was estimated that 500,000 horses had died in the province of Samara alone. From a calculation it was believed that of a million of horses no more than 400,000 would be alive at the end of last month, and these would be in such an exhausted condition as to be useless for heavy agricultural labor. This is, indeed, a serious matter, not only presently, but prospectively, as it will require many years to replace these animals, and agriculture will accordingly suffer, even if the seasons should prove propitious. We do not hear that the starving peasants availed themselves of the flesh of the horses as food, and it might be inferred that they did not, but like our soldiers in the Crimea, preferred to perish rather than consume such food. The French at Metz and in Paris in 1870-71 were not so "nice."—*Medical Record.*

IMMUNITY.—Professors Brieger and Kitasato, and Dr. Wassermann, working in Koch's laboratory, have found a method of preparing a substance which confers immunity to animals from infective diseases such as typhoid, diphtheria, cholera and tetanus. The bacilli of these diseases, with their culture fluids, are exposed to the action of extracts of thymus gland at a temperature of 65° to 80° C. This kills the bacilli, but leaves in the fluid an antitoxine which confers immunity. Immunity seems to be secured rather easily and in various ways in experimental laboratories. What is wanted is something that works in practice. Recently Dr. G. Taruffi has reported a sixth case of tetanus cured by the antitoxine of Tizzoni and Cantani, and this has an encouraging look.—*Medical Record.*

A WORTHY SANITARY FEAT QUIETLY ACCOMPLISHED.—It is alleged for General Rusk that he has greatly improved the treatment of cattle exported to Europe for food purposes. The mortality among them at sea, resulting from cruelty, want of water, etc., was formerly stated at sixteen per cent., while at the present time it is one per cent. The value of these exportations is not far from \$25,000,000 annually. If this statement is only partly true, General Rusk has accomplished a great sanitary reform, for he has been the means of indirectly purifying the flesh-food supply of thousands of European consumers.—*N. Y. Medical Journal.*